CLAIMS

What is claimed is:

1. A method comprising the steps of:

a) sampling at least one of a tip and a ring signal to determine a line voltage and a line current of a linefeed component of a subscriber loop;

b) estimating an instantaneous power dissipation of the linefeed component;

c) filtering the estimated instantaneous power dissipation to generate an estimated junction temperature.

2. The method of claim 1 further comprising the step of:

d) generating a thermal alarm, if the estimated junction temperature exceeds an alarm threshold.

3. The method of claim 2, further comprising the step of:

e) timesharing a same monitoring circuitry to perform steps a)-d) for each linefeed driver component being monitored.

4. The method of claim 1 further comprising the step of:

d) programming a filter with filtering parameters corresponding to thermal characteristics of the linefeed component.

5. A method comprising the steps of:

a) selecting a selected linefeed component of a plurality of linefeed components coupled to a subscriber loop having a tip signal and ring signal;

b) sampling at least one of the tip and the ring signals to determine a voltage and a current associated with the selected linefeed component;

c) estimating an instantaneous power dissipation of the selected linefeed component; and

d) filtering the estimated instantaneous power dissipation to generate an estimated junction temperature of the selected linefeed component.

6. The method of claim 5 further comprising the step of

e) providing a thermal alarm indicator, if the estimated junction temperature exceeds an alarm threshold.

7. A subscriber loop signal processor apparatus, comprising:

an analog-to-digital converter (ADC) for sampling at least one of a tip and a ring signal;

a power calculator coupled to calculate an instantaneous power dissipation of a selected linefeed driver component from the sampled signal and control currents provided to a plurality of linefeed driver components; and

a filter providing an estimated junction temperature of the selected linefeed driver component from the instantaneous power dissipation.

8. The apparatus of claim 7 further comprising:

a comparator providing an alarm indicator if the estimated junction temperature exceeds an alarm threshold.

9. The apparatus of claim 7 further comprising:

a multiplexer coupling the at least one tip and ring signal to the analog-to-digital converter to enable providing an estimated junction temperature of any of the linefeed components using a same ADC, power calculator, and filter.

10. The apparatus of claim 9 wherein a multiplexer control is time based to enable time-sharing the same ADC, power calculator, and filter for each linefeed component.

11. The apparatus of claim 7 wherein the ADC, the power calculator, and the filter reside within a same integrated circuit package.

12. The apparatus of claim 7 further comprising:

a re-writable nonvolatile memory coupled to provide filter parameters corresponding to thermal characteristics of the linefeed components to the filter.

13. A subscriber loop interface circuit apparatus comprising:

a signal processor having sense inputs for sensing a tip line and a ring line of a subscriber loop, the signal processor generating subscriber loop control signals; and

a linefeed driver for driving the subscriber loop in accordance with the subscriber loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line and a ring fuse series-coupled to the ring line, wherein the sensed tip signal includes first and second sampled tip voltages sampled from opposing sides of the tip fuse, wherein the sensed ring signal includes first and second sampled ring voltages sampled from opposing ends of the ring fuse.

14. The subscriber loop linefeed driver of claim 13 wherein a difference between the first and second sampled tip voltages is proportional to the tip current, wherein a difference between the first and second sampled ring voltages is proportional to the ring current.

15. A method comprising the steps of:

generating subscriber loop control signals in response to a sensed tip signal and a sensed ring signal of a subscriber loop, wherein the tip signal is sensed before and after a tip fuse, wherein the ring signal is sensed before and after a ring fuse; and

driving the subscriber loop in accordance with the subscriber loop control signals.

16. A subscriber loop interface circuit apparatus comprising:

a signal processor having sense inputs for sensing a tip line and a ring line of a subscriber loop, the signal processor generating subscriber loop control signals; and

a linefeed driver for driving the subscriber loop in accordance with the subscriber loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line and a ring fuse series-coupled to the ring line, wherein the tip line and ring line are each sensed at two locations to determine both a status of each fuse and a power dissipation of each linefeed driver component.